

Procurement Plan for next 3 – 5 Years (CSIR-CBRI, Roorkee)

Items	Approx. Cost (Rs. in lakh)
Multichannel Electrochemical workstation	50.0
Digital Rheometer	10.0
Digital Tensiometer	10.0
Digital Universal Testing Machine (50KN)	20.0
ATR-FTIR (Full range)	35.0
Raman Spectrometer	35.0
Electric Furnace (2200°C)	20.0
Universal Testing Machine (Cyclic)	150
Actuators with Power Pack	150
Impact Test Setup with variable Velocity	100
Bi-axial Shake table	200
D. C. Power supply (Transformer)	0.50
Fatigue Testing Machine	50.0
Furnace (1100°C) 1.5m x 0.4m x 0.4m for RC elemental testing	3.0
Reaction Wall	15.0
Hydraulic Jack (50T)	2.0
Pre-stressing Jack with setup	5.0
Accelerometer	3.0
Extensometer	2.0
Flat Jack test apparatus	4.0
Drilling Machine	1.0
Steel Rebar (Fe 500) primary	5.0
Computer (High configuration)	2.0
UPS (2 kVA)	1.00
Stabilizers	0.30
Fork lift	3.0
Jack lift	1.0
Chain pulley (long chain)	0.3
Digital Shrinkage measurement apparatus	5.0
Air Void analyser	25.0

Accelerated Curing Tank	15.0
Oxygen Permeability apparatus	5.0
Carbonation Chamber	12.0
Freeze and thaw apparatus	15.0
Magnetic stirrer	0.5
Digital Analytical balance (220 gm)	5.0
Digital pH Meter	2.0
Voltage Stabilizers	1.0
Doubled distilled water apparatus	2.0
Laboratory Autoclave	5.0
Ball mill (10 kg capacity)	5.0
Chloride Threshold Measurement Test Setup inclusive of: (a) Two Reference anodes and Counter Electrodes (b) Chloride/ Temperature combination electrode (c) Double walled glass vessel for temperature control (d) Electronic meter with temperature control to directly find percent chloride	5.0
Construction Materials (Cement, sand, aggregates, fibers etc.)	20.0
Industrial Robot Manipulator	35
Metal 3D printer	50
Multifunctional CNC machine	50
Portable Sound Analyzer	40
Performance Real-Time target machine	50
PXI Automated test system	40
LiDAR 3D scanner	80.00
Uni/Biaxial Shaking table	300.00
True Triaxial System	150.00
Rock Triaxial system	100.00
FBG sensor network with data collection package	60.00
GPR	70.00
Ambient Microtremor System	90.00
Software Packages: FLAC, MATLAB, Minitab	50.00

Optical & Multi-spectral Imaging Sensor based Drone for Landslide Early Warning	35.00
UAV Laboratory including Infrastructure, Drone, 3D Printer etc.	80.00
Mobile Van with Computational facility for Drone based Landslide Early Warning	15.00
Rock Testing Laboratory including Infrastructure, Direct Shear, Tri-axial equipments etc.	500.00
Flume Test Facility for Debris Flow Run-out-effect and Risk Assessment with different measurement sensors and data logger	10.00
BODTA strain/displacement measurement sensor along with data logger	17.00
Design and fabrication of slope reinforcement experimental facility	10.00
Laser displacement sensors	15.00
Strain gauges, rubber membrane etc.	3.00
LVDT, Load Cells, Digital Camera, Colour Printer	5.00
Experiment laboratory set-up for studying rolling behaviour of rock fall on artificially created slope/ramp with velocity and impact/pressure sensors	20.00
Vertical drop test facility creation for rock fall impact study	30.00
Pendulum type test set-up to test performance of rock fall fences in low energy impacts	25.00
Resonant Column Apparatus (RCA)	40.00
LiDAR 3D Laser Scanner	80.00
FBG sensor network with data collection package	60.00
GPR	70.00
Load cell, pore pressure transducers, data loggers, linear variable differential transformers, seismic earth pressure cells, accelerometers, strain gauges, displacement transducers, pressure grout unit, Co-axial probe for Dielectric measurement.	40.00
FLAC3D, MATLAB, Minitab, blasting simulation software, tunneling and geotechnical software.	50.00
Fourier Transformation Infrared Spectrophotometer	30.0
High temperature programmable Furnace	15.0
Isothermal Calorimetry	25.0
Portable thermal conductivity analyzer	10.0
Muffle furnace	10.0
Diamond Polisher	0.50
Tray dryer	3.0
Concrete mixture	0.5
Vertical centrifugation pump	0.5
Vacuum pump	0.25
Sample holder for XRD Instrument	0.25
Gold sputter coater	5.0

Pilot plant for microencapsulation.	5.0
Temperature data logged system	5.0
SO _x , NO _x analyzer etc	1.0
Calorific value measurement equipments	0.50
Flue Gas Analyser	5.00
Ovens	1.0
Glass wares	3.0
Chemicals	5.0
Calorimetry for cement and concrete	60.0
Toxicity Characteristics Leaching Processing (TCLP) equipment	10.0
Particle Size Analyser	25.0
Compression Testing Machine (3000 kN)	6.0
Plenary Mixer	10.0
Electric Oven (200°C)	35.0
Electric Furnace (1800°C)	15.0
Environmental chamber	15.0
Pull off adhesion test equipment	10.0
Planetary ball mills	20.0
Thermogravimetric analysis (TGA/DTA & DTG hook-up system)	50.0
Laser flash benchtop Thermal conductivity range of -150°C to 1600°C	35.0
Universal Data Logging System (temperature, displacement, load, etc)	12.0
Computer controlled servo hydraulic jack (Double action: compression and tension)	10.0
Automatic Blaine's Fineness Apparatus	1.0
Bulk resistivity meter (upto 8 cell)	10.0
Table top Digital microscope or desktop SEM	10.0
Fourier-transform infrared spectroscopy (FTIR) or upgradation or upgradation	40.0
Automax Compression Testing Machine:	20.0
Moulds etc.	2.0
Analytical balance (capacity: 500gms) and weigh balance (100 kg)	1.5
Concrete shrinkage measurement apparatus	5.0
Air permeability apparatus	20.0
CAPO Tester	15.0
Corrosion Analyser	10.0
UPV Testing equipments	5.0
Twin screw extruder	25.0
Injection molding machine	60.0
Compression molding machine	40.0
Ultrasonicator	5.0
Vacuum Infusion Machine	1.0
Chemicals and glasswares	25.0

Cement materials, sand, aggregates, fibers etc.	25.0
Research 3D Concrete Printer System	80
Production Concrete 3D printer System	130.
On site Concrete 3D printer	190
Stack monitoring kit	10
SO _x , NO _x , VOC, CO ₂ , CO, H ₂ S and other Gaseous Pollutant Monitoringsampler	16
Continuous Ambient Air Quality Monitoring Stations	15
Ambient Air Dust Sampler, PM ₁₀ , PM _{2.5} sampler	15
Portable water quality (BOD, COD, DO, colour, turbidity etc) measuring equipment's	12
Hot air oven and muffle furnace	12
Ball mill, workstation, laptop, freeze thaw apparatus, weighing balance, stirrer, proving ring, colour printer, moulds, small laboratory equipments	8
Particle Imaging Velocimetry	80
Wind Tunnel Instrumentation	25
Artificial Sky upgradation	10
High Resolution Camera	10
UV-VIS-NIR Spectrophotometer	90
Heat Transfer Wind Tunnel	25
Steady State U Value Apparatus	75
Building Energy simulation Computational Facility with softwares	25
2 Psychrometric Chambers	50
Solar Air conditioner	25
Geo-Thermal Air conditioner	40
Electrical properties Earth Resistivity, Insulation, Megger, Di-electric tester	10
Solar Thermal Collectors setup	10
Solar PV panels setup	5
Load Setup	5
Induction motor with controller	2
DC motor with controller	2
BLDC motor with controller	2
Tachometer	1
Torque meter	1
Pressure transmitter	2
Flow rate controller	2
Flow rate measurement sensor	5
Data Logger	5
High wattage DC supply	3
High wattage AC supply	3
AC-DC electronic load convertor	20
PV Simulator	30
Different Micro Controller Board	2

PV with battery bank and invertor (10KW)	10
Power Analyzer	8
Scada/PLC	1
Workstation (4)	20
Laptop (6)	5
Electronic Accessories/Instrumentation/Sensors	10
Thermal Imagine Camera	10
Weather Station	5
CNC Machine	25
Smart meter	0.5
fabrication of solar cooker	1.5
Wind turbine for ground water puming	4
common coupling point	0.5
Charge controller	2
Wind turbine with generator	4
Ducting	8
Costing	3.5
TRT testing	18.5
Heat Pumps 12/40	13.5
No of Drills(100-120m)	9.9
Circulator Pumps	4.7
Pipes + Accessories Valves	2.5
Accessories + Insulation	4.8
GHX exchangers	2.2
Electrical Panels / Controls	3.3
FCU	2
Solar PV-9 KWp	4.06
Electronic Manger (real time monitoring)	2.25
Software eManager	0.75
Real Time visualtion	1.5
Demo Building	90
Mechanical Load Tester	5
Thermopile detector	1
Grey Scale CMOS camera	5
Data Acquisition system	10
Microbalance	5
Motor-Generator setup	5
Heat Pumps 12/40	16.5
No of Drills(100-120m)	5.4
Circulator Pumps	9.9
Pipes + Accessories Valves	4.5
Accessories + Insulation	2
GHX exchangers	1.92
Electrical Panels / Controls	2
FCU	1.65
Thermal Response Test	3.5
Workstation	3.5
Data Logger	5

Blower with VFD	2
Pressure Transmitter	1.25
Thermal Imaging Camera	10
Variac	0.25
Orifice Meter	0.2
Micro Manometer	0.3
LVDT (6 Nos)	1
Data Acquisition System	2.5
Steel Moulds	0.25
Crack Micro Scope	0.15
Weather Station	5
Solar Simulator	30
Solar Cooker	2
PV/T Collector	10
Wind turbine and accessories	5
VAWT with ground water pump	8
VWSG data logger and sensors	10
Pneumatic pressure loading setup with instrumentation for wind resistant testing of windows and facades	150
25T Actuator for existing 300T UTM	60
Hand held structural scanner	15
Mid-wave IR Camera	70
Piezo-electric actuator and sensors and setup for SHM	25
Total	330
Intelligent Fire Alarm system, Flame ionization detection, Command Room, UPS, Motion sensor etc..	25.0
Thermal imaging camera	35.0
Escape route system	5.0
Smoke density measurement system	10.0
Continuous emission monitoring system	35.0
Work station and Its peripherals	5.0
Gas Analyzer	15.0
Differential Thermo gravimetric analyzer	35.0
Hot disk thermal constant analyzer	40.0
Fourier Transform Infrared spectroscopy (FTIR)	80.0